

**WHAT IS CLAIMED IS:**

1. An assembly, comprising:

a cylinder and a piston assembly housed within the cylinder and configured for reciprocal, linear in space and sinusoidal in time motion relative to the cylinder, the  
5 piston assembly and cylinder including a magnet and coil configured to undergo relative motion with the relative motion of the piston assembly and cylinder,

a transition arm, and

a rotating member coupled to the piston assembly by the transition arm.

2. The assembly of claim 1 wherein the magnet is coupled to the piston  
10 assembly for reciprocal motion therewith.

3. The assembly of claim 1 wherein the coil is coupled to the cylinder.

4. The assembly of claim 1 wherein the piston assembly is single-ended.

5. The assembly of claim 1 wherein the piston assembly is double-ended.

6. The assembly of claim 5 wherein a magnet and coil are positioned at  
15 both ends of the double-ended piston assembly.

7. The assembly of claim 5 wherein one end of the double-ended piston assembly is configured to function as a gasoline engine.

8. The assembly of claim 5 wherein one end of the double-ended piston assembly is configured to function as a pump.

- 20 9. The assembly of claim 1 wherein the piston assembly has a piston head at one end and a guide rod at the other end.

10. The assembly of claim 1 wherein the rotating member is coupled to the piston assembly such that alternating current is produced at the coil at a revolving frequency of the rotating member.

11. The assembly of claim 1 wherein the assembly comprises three 120° spaced cylinders and piston assemblies.

12. The assembly of claim 1 wherein the coil is positioned inside the magnet.

13. The assembly of claims 1 and 12 wherein the coil is positioned outside the magnet.

14. The assembly of claim 1 comprising a pump or compressor wherein the piston assembly includes a piston head coupled to the magnet and coil by a piston rod.

15. The assembly of claim 14 further comprising a second piston assembly driven by the same magnet and coil.

16. The assembly of claim 1 wherein the rotating member comprises a flywheel.

17. The assembly of claim 1 wherein the transition arm is coupled to a stationary support.

18. The assembly of claim 17 wherein the support comprises a U-joint.

19. The assembly of claim 1 configured for converting between phases.

20. A method of generating power, comprising:

providing a rotating member coupled to a piston assembly by a transition arm, the piston assembly being housed within a cylinder and configured for reciprocal,

linear in space and sinusoidal in time motion relative to the cylinder, the piston assembly and cylinder including a magnet and coil configured to undergo relative motion with the relative motion of the piston assembly and cylinder, and

rotating the rotating member such that power is generated by the magnet and  
5 coil.

21. A method comprising:

providing a rotating member coupled to a piston assembly by a transition arm,  
the piston assembly being housed within a cylinder and configured for reciprocal,  
linear in space and sinusoidal in time motion relative to the cylinder, the piston  
10 assembly and cylinder including a magnet and coil configured to undergo relative  
motion with the relative motion of the piston assembly and cylinder, and

applying power to the coil to cause the rotating member to rotate.